Progress Report
Project number MT141
for the Period
July 1, 2006 to December 31, 2006

PROJECT TITLE: Evaluation of Methods for Estimation of Bridge-Pier Scour for Coarse Bed Streams Based on Measured Pier Scour in Montana

PROJECT CHIEF: Steve Holnbeck, Hydrologist, USGS

COOPERATING AGENCIES: Montana Department of Transportation

BEGIN DATE: July 2000

COMPLETION DATE: December 31, 2007

FUNDING: FY2000-- $7,200; FY2001-- $103,090; FY2002--$25,990; FY2003--$25,990

FY2004--$25,990; FY2005--$25,990; FY2006--$25,990 ; FY2007--$81,550

OBJECTIVES: The major objectives of this project are to (1) evaluate existing methods for estimation of pier scour based on currently available pier-scour measurements in Montana and other States having coarse-bed streams and (2) collect additional pier-scour data for coarse-bed streams in Montana over a 6-year period.

SCOPE: Several pier-scour equations that may provide more accurate and reliable estimates of pier scour for coarse bed streams will be evaluated by comparing measured scour with scour predicted from the equations for the same hydraulic conditions. Equations to be evaluated include (1) HEC-18 (current recommended equation), (2) HEC-18 with proposed revisions to account for size of bed material, (3) Froehlich Design equation, and (4) Simplified Chinese equation.

Pier-scour measurements will be made each year at 10-25 sites, depending upon hydrologic conditions. At the end of the 6-year data-collection period, data will be compiled and described in a report.

PRODUCTS: Two USGS Scientific Investigations Reports are proposed. The first report has been published and describes the comparisons between equations based on published data. The second (planned for publication in 2007) will document collected pier-scour data at the end of the data-collection period.

PROGRESS: Scour measurements were made at over 50 bridge sites over the six-year study period for a range of bed-material size, pier sizes, and hydraulic conditions. All fieldwork is completed and data analysis is underway. Report writing has begun, and a draft report will be submitted by June 30, 2007.